U. S. Department of Commerce
Malcolm Baldrige
Secretary

National Bureau of Standards
Ernest Ambler, Director

National Bureau of Standards

Certificate of Analysis

Standard Reference Material 25d

Manganese Ore

(In Cooperation with the American Society for Testing and Materials)

This Standard Reference Material (SRM) is intended for use in evaluating chemical methods of analysis and in calibrating equipment used in instrumental methods. SRM 25d, Manganese Ore, is in the form of powder (200 mesh). The certified values are given below and are based on samples dried for 2 hours at 120 °C. A minimum sample size of 200 mg of the dried material should be used for any analytical determination to be related to the certified values of this certificate.

Constituent	Certified Value[1] Percent by Weight	Estimated[2] Uncertainty
Manganese	51.78	0.12
Available Oxygen	14.28	.07
SiO_2	2.52	.11
Al_2O_3	5.32	.07
Fe_2O_3	3.92	.09
K_2O	0.93	.02
P_2O_5	.25	.01
TiO_2	.13	.01

[1]The certified value listed for a constituent is the present best estimate of the "true" value based on the results of the cooperative program for certification.

[2]The estimated uncertainty listed for a constituent is based on judgment and represents an evaluation of the combined effects of method imprecision, possible systematic errors among methods, and material variability. (No attempt was made to derive exact statistical measures of imprecision because several methods were involved in the determination of most constituents.)

The overall coordination of the technical measurements leading to certification was performed under the direction of J.I. Shultz, Research Associate, ASTM-NBS Research Associate Program.

The technical and support aspects involved in the preparation, certification, and issuance of this SRM were coordinated through the Office of Standard Reference Materials by T.E. Gills.

Washington, DC 20234
February 10, 1984

Stanley D. Rasberry, Chief
Office of Standard Reference Materials

(over)

PLANNING, PREPARATION, TESTING, ANALYSIS:

The material for this SRM was provided and prepared by Elkem Metals Company, Marietta, Ohio. Homogeneity testing was performed in the Inorganic Analytical Research Division by G. Marinenko. The homogeneity is based on the determination of total manganese by the sodium bismuthate oxidation procedure. The material heterogeneity is less than can be detected by the analytical method ($\leq 0.2\%$ relative).

Cooperative analyses for certification were performed in the following laboratories:

Andrew S. McCreath & Son, Inc., Harrisburg, Pa., F.A. Pennington, Jr., L.W. Richards, F. Hagenberger, C. Jacoby and G. Bruno.

Elkem Metals Company, Marietta, Ohio, H.H. Hall.

Ledoux & Company, Teaneck, N.J., S. Kallmann and C.L. Maul.

National Bureau of Standards, Inorganic Research Division, G. Marinenko, Y.C. Wu and R.L. Watters, Jr.

The constituents indicated below are *not certified,* but are given as additional information on the composition of this material.

Element	Concentration Percent by Weight
BaO	(0.21)
CaO	(.052)
Moisture	(.96)